

Exploring Multiples

Reporting Category Patterns, Functions, and Algebra

Topic Exploring patterns

Materials

- Hundred Chart (attached)
- Linking cubes
- Bags
- Recording Sheet (attached)
- Crayons or markers
- Multiplication Table (attached)

Vocabulary

pattern, multiples

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

Skip counting can furnish practice with multiples while deepening students' understanding of multiplication facts. Students are able to observe visual patterns resulting from identifying the multiples of a number. Note: Use Hundred Chart.

1. Distribute copies of the attached Hundred Chart and bags of linking cubes. Beginning with the number 2, have students skip count by twos, marking the multiples of 2 with linking cubes on the chart. Students will begin placing the linking cubes as they skip count, however, many students will soon see the pattern of every other number and begin placing the cubes according to the pattern rather than the skip counting. Have students describe the pattern.
2. Have students practice skip counting by threes and marking the multiples of 3 on the chart. It is important that students be able to describe verbally the pattern that is formed on the chart. Repeat the process for skip counting by fours, fives, sixes, and so forth up to twelves.
3. At a later time, have students repeat step 2. This time, distribute crayons or markers and copies of the recording sheet, and have students record the patterns on the sheet by coloring in each skip-counted number. Follow this activity with questions designed to help students understand the relationship between skip counting the multiples of a number and multiplication. For example, after they have skip counted by 3 and colored in the multiples of 3, ask students what number is the fourth colored multiple. When they respond "12," ask what 4 times 3 equals. Continue this type of questioning so that students come to better understand multiples of a number and how multiplication is a shortcut for skip counting.

4. Have students examine their recording sheets and describe the differences and similarities among the patterns. Ask whether 239 is a multiple of 6. Ask how they know.
5. Distribute copies of the attached Multiplication Table template, and have students use the recording sheets on which they marked all of the multiples to transfer these findings to the table. Discuss the patterns that are formed.

Assessment

- **Questions**
 - If a number is a multiple of 6, is it also a multiple of 2? Of 4?
 - How is a number a multiple? Explain by giving an example.
- **Journal/Writing Prompts**
 - Explain what is meant by the word *multiple*.
 - Describe the pattern found on the multiplication table. Explain how you determined there is a pattern. Tell how this increased your understanding of the word *multiple*.

Extensions and Connections (for all students)

- Direct students to skip count on the hundred chart by twos and then by threes, marking the multiples of 2 with one color linking cube and the multiples of 3 with a different color cube. Ask which numbers have two colors on them (6, 12, 18...) Ask why. Ask, "Why is 'Common Multiples' a good name for this set of numbers?"

Strategies for Differentiation

- **Technology**
 - Provide students with enlarged recording sheets.
 - Provide students with enlarged copies of the multiplication table.
 - Use technology to model filling in the recording sheet for students.
- **Multisensory**
 - Have students use response boards (e.g., chalk, dry erase) to record patterns and hold them up in class presentations.
 - Have students develop pattern sequences on the board, using plastic magnetic numbers.
- **Community Connections**
 - Invite a ride controller/worker from an amusement park to visit the class and show students that patterns of two and three are used for roller coasters and other rides. The patterns are formed by the lines or arrangement of seats on a ride.
- **Small-Group Learning**
 - Divide students into groups of three, and have them read an appropriate piece of literature that includes a pattern(s) in the story.
 - Have students use calculators to skip count and find new patterns to share with classmates.
- **Student Organization of Content**
 - Have students create a journal entry explaining what a pattern is and giving an example of one.

Hundred Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Recording Sheet

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Multiplication Table

X	1	2	3	4	5	6	7	8	9
1									
2									
3									
4									
5									
6									
7									
8									
9									